

## Environmental Protection Agency

## § 98.273

semichemical chemical recovery combustion unit.

(d) CO<sub>2</sub>, biogenic CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions from each kraft or soda pulp mill lime kiln.

(e) CO<sub>2</sub> emissions from addition of makeup chemicals (CaCO<sub>3</sub>, Na<sub>2</sub>CO<sub>3</sub>) in the chemical recovery areas of chemical pulp mills.

(f) CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O combustion emissions from each stationary combustion unit. You must calculate and report these emissions under subpart C of this part (General Stationary Fuel Combustion Sources) by following the requirements of subpart C.

### § 98.273 Calculating GHG emissions.

(a) For each chemical recovery furnace located at a kraft or soda facility, you must determine CO<sub>2</sub>, biogenic CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions using the procedures in paragraphs (a)(1) through (a)(3) of this section. CH<sub>4</sub> and N<sub>2</sub>O emissions must be calculated as the sum of

emissions from combustion of fossil fuels and combustion of biomass in spent liquor solids.

(1) Calculate fossil fuel-based CO<sub>2</sub> emissions from direct measurement of fossil fuels consumed and default emissions factors according to the Tier 1 methodology for stationary combustion sources in § 98.33(a)(1).

(2) Calculate fossil fuel-based CH<sub>4</sub> and N<sub>2</sub>O emissions from direct measurement of fossil fuels consumed, default HHV, and default emissions factors and convert to metric tons of CO<sub>2</sub> equivalent according to the methodology for stationary combustion sources in § 98.33(c).

(3) Calculate biogenic CO<sub>2</sub> emissions and emissions of CH<sub>4</sub> and N<sub>2</sub>O from biomass using measured quantities of spent liquor solids fired, site-specific HHV, and default or site-specific emissions factors, according to Equation AA-1 of this section:

$$CO_2, CH_4, \text{ or } N_2O \text{ from biomass} = (0.90718) * Solids * HHV * EF \quad (\text{Eq. AA-1})$$

Where:

CO<sub>2</sub>, CH<sub>4</sub>, or N<sub>2</sub>O, from Biomass = Biogenic CO<sub>2</sub> emissions or emissions of CH<sub>4</sub> or N<sub>2</sub>O from spent liquor solids combustion (metric tons per year).

Solids = Mass of spent liquor solids combusted (short tons per year) determined according to § 98.274(b).

HHV = Annual high heat value of the spent liquor solids (mmBtu per kilogram) determined according to § 98.274(b).

EF = Default emission factor for CO<sub>2</sub>, CH<sub>4</sub>, or N<sub>2</sub>O, from Table AA-1 of this subpart (kg CO<sub>2</sub>, CH<sub>4</sub>, or N<sub>2</sub>O per mmBtu).

0.90718 = Conversion factor from short tons to metric tons.

(b) For each chemical recovery combustion unit located at a sulfite or stand-alone semichemical facility, you must determine CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions using the procedures in paragraphs (b)(1) through (b)(4) of this section:

(1) Calculate fossil CO<sub>2</sub> emissions from fossil fuels from direct measurement of fossil fuels consumed and default emissions factors according to the Tier 1 Calculation Methodology for stationary combustion sources in § 98.33(a)(1).

(2) Calculate CH<sub>4</sub> and N<sub>2</sub>O emissions from fossil fuels from direct measurement of fossil fuels consumed, default HHV, and default emissions factors and convert to metric tons of CO<sub>2</sub> equivalent according to the methodology for stationary combustion sources in § 98.33(c).

(3) Calculate biogenic CO<sub>2</sub> emissions using measured quantities of spent liquor solids fired and the carbon content of the spent liquor solids, according to Equation AA-2 of this section:

$$Biogenic \ CO_2 = \frac{44}{12} * Solids * CC * (0.90718) \quad (\text{Eq. AA-2})$$

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Where:

Biogenic CO<sub>2</sub> = Annual CO<sub>2</sub> mass emissions for spent liquor solids combustion (metric tons per year).

Solids = Mass of the spent liquor solids combusted (short tons per year) determined according to § 98.274(b).

CC = Annual carbon content of the spent liquor solids, determined according to § 98.274(b) (percent by weight, expressed as a decimal fraction, e.g., 95% = 0.95).

44/12 = Ratio of molecular weights, CO<sub>2</sub> to carbon.

0.90718 = Conversion from short tons to metric tons.

(4) Calculate CH<sub>4</sub> and N<sub>2</sub>O emissions from biomass using Equation AA–1 of this section and the default CH<sub>4</sub> and N<sub>2</sub>O emissions factors for kraft facilities in Table AA–1 of this subpart and convert the CH<sub>4</sub> or N<sub>2</sub>O emissions to metric tons of CO<sub>2</sub> equivalent by multiplying each annual CH<sub>4</sub> and N<sub>2</sub>O emissions total by the appropriate global warming potential (GWP) factor from Table A–1 of subpart A of this part.

(c) For each pulp mill lime kiln located at a kraft or soda facility, you must determine CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions using the procedures in paragraphs (c)(1) through (c)(3) of this section:

(1) Calculate CO<sub>2</sub> emissions from fossil fuel from direct measurement of

fossil fuels consumed and default HHV and default emissions factors, according to the Tier 1 Calculation Methodology for stationary combustion sources in § 98.33(a)(1); use the default HHV listed in Table C–1 of subpart C and the default CO<sub>2</sub> emissions factors listed in Table AA–2 of this subpart.

(2) Calculate CH<sub>4</sub> and N<sub>2</sub>O emissions from fossil fuel from direct measurement of fossil fuels consumed, default HHV, and default emissions factors and convert to metric tons of CO<sub>2</sub> equivalent according to the methodology for stationary combustion sources in § 98.33(c); use the default HHV listed in Table C–1 of subpart C and the default CH<sub>4</sub> and N<sub>2</sub>O emissions factors listed in Table AA–2 of this subpart.

(3) Biogenic CO<sub>2</sub> emissions from conversion of CaCO<sub>3</sub> to CaO are included in the biogenic CO<sub>2</sub> estimates calculated for the chemical recovery furnace in paragraph (a)(3) of this section.

(d) For makeup chemical use, you must calculate CO<sub>2</sub> emissions by using direct or indirect measurement of the quantity of chemicals added and ratios of the molecular weights of CO<sub>2</sub> and the makeup chemicals, according to Equation AA–3 of this section:

$$CO_2 = \left[ M_{(CaCO_3)} * \frac{44}{100} + M_{(Na_2CO_3)} \frac{44}{105.99} \right] * 1000 \text{ kg/metric ton} \quad (\text{Eq. AA-3})$$

Where:

CO<sub>2</sub> = CO<sub>2</sub> mass emissions from makeup chemicals (kilograms/yr).

M (CaCO<sub>3</sub>) = Make-up quantity of CaCO<sub>3</sub> used for the reporting year (metric tons per year).

M (NaCO<sub>3</sub>) = Make-up quantity of Na<sub>2</sub>CO<sub>3</sub> used for the reporting year (metric tons per year).

44 = Molecular weight of CO<sub>2</sub>.

100 = Molecular weight of CaCO<sub>3</sub>.

105.99 = Molecular weight of Na<sub>2</sub>CO<sub>3</sub>.

### § 98.274 Monitoring and QA/QC requirements.

(a) Each facility subject to this subpart must quality assure the GHG emissions data according to the applicable requirements in § 98.34. All QA/QC

data must be available for inspection upon request.

(b) Fuel properties needed to perform the calculations in Equations AA–1 and AA–2 of this subpart must be determined according to paragraphs (b)(1) through (b)(3) of this section.

(1) High heat values of black liquor must be determined no less than annually using T684 om–06 Gross Heating Value of Black Liquor, TAPPI (incorporated by reference, see § 98.7). If measurements are performed more frequently than annually, then the high heat value used in Equation AA–1 of this subpart must be based on the average of the representative measurements made during the year.